

eMAS Scale Factor Analysis

last updated 9/15/14

- eMAS calibration reference: [pre-deployment lab cal](#)
- AFRL: using average of high-altitude data set
- GSFC analysis uses so-called “Pixel Aggregation” reflectance method unless otherwise noted
- RBA = Retrieval-Based Adjustment method
- RBF = Reflectance Band Fit (after RSP analysis)

Terra/eMAS

[Band] CW (μm) or Cloud Retrieval	Pre/Post- Calibration Change	FL# 2: Aug 02, 2013 (Terra ~10° view angle pass, marine stratus - cloud not as thick as Oct 24)							FL#3: Sept 6 (Terra nadir, clear sky scene over land)							FL#2/19: Oct 24 (Terra nadir, marine Stratus over ocean and clear sky scene over land)						
		GSFC				Ames	RSP		GSFC				Ames	RSP		GSFC				Ames	AFRL	
		RBA	Refl w/view angle matching region (VAMR)	RBF Scale	RBF Offset	Rad	RBF Scale	RBF Offset	Refl (VAMR)	RBF Scale	RBF Offset	Rad	RBF Scale	RBF Offset	RBA	Refl (VAMR)	RBF Scale	RBF Offset	Rad	Vicarious/MCS T (scaled to pre-depl.)		
[1] 0.47	-7.1%		1.13	1.09	0.0051	1.08	1.06	-0.0026	1.11	0.81	0.0334	1.11	1.08	-0.0052		1.15	1.13	0.0071	1.12	1.13		
[2] 0.55	-6.6%		1.02	1.01	-0.0015	0.93	1.20	-0.0337	1.00	0.70	0.0328	0.95	1.18	-0.0127		1.01	1.01	0.0021	0.98	1.02		
[3] 0.65	-5.2%		1.02	0.98	0.0033	0.95	1.02	-0.0045	0.96	0.77	0.0223	0.94	1.07	-0.0078		0.99	0.99	-0.0007	0.98	1.03		
[7] 0.86/tau _{2.1}	-6.5%	1.00	1.03	1.03	-0.0015	0.96	1.12	-0.0078	1.00	0.82	0.0427	0.98	1.30	-0.0123	0.99	0.99	0.98	0.0044	0.93	1.01		
[10] 1.6/re _{1.6}	-4.9%	0.93	1.06	1.08	-0.0057	0.90	0.97	-0.0050	1.01	0.94	0.0166	0.96	1.04	-0.0286	0.94	1.02	1.00	0.0085	0.97	0.99		
[20] 2.1/re _{2.1}	-4.6%	0.95	0.96	0.97	-0.0045	0.81	0.87	-0.0034	0.85	0.92	-0.0196	0.85	0.95	-0.0265	0.95	0.90	0.90	-0.0011	0.90	0.98		

Aqua/eMAS and Combined Comparison

[Band] CW (μm) or Cloud Retrieval	Pre/Post- Calibration Change	FL# 16: Aug 21 (Aqua ~15° view angle pass, clear sky scene over land)				FL#7: Sept 9 (Aqua ~15° view angle pass, clear sky scene over land)				FL#13: Sept 11 (Aqua ~15° view angle pass, clear sky scene over land)				Combination of all Comparisons except Aug 02 (Terra and Aqua)			
		GSFC			GSFC	GSFC			Refl (VAMR)	RBF Scale	RBF Offset	RBF Scale	RBF Offset	RBF Scale	RBF Offset	RBF Scale	RBF Offset
		Refl (VAMR)	RBF Scale	RBF Offset	Refl (VAMR)	RBF Scale	RBF Offset	Refl (VAMR)	RBF Scale	RBF Offset	RBF Scale	RBF Offset	RBF Scale	RBF Offset	RBF Scale	RBF Offset	
[1] 0.47	-7.1%	1.09	0.86	0.0236	1.10	0.70	0.0394	1.08	0.92	0.0217	1.16	-0.0076					
[2] 0.55	-6.6%	0.98	0.82	0.0160	0.98	0.71	0.0250	0.98	0.90	0.0104	1.02	-0.0043					
[3] 0.65	-5.2%	0.90	0.81	0.0059	0.93	0.80	0.0088	0.93	0.86	0.0081	0.99	-0.0050					
[7] 0.86/tau _{2.1}	-6.5%	0.97	0.66	0.1100	0.96	0.70	0.0750	0.96	0.85	0.0306	1.00	-0.0080					
[10] 1.6/re _{1.6}	-4.9%	1.03	0.96	0.0135	1.00	0.91	0.0123	1.02	0.94	0.0163	1.03	-0.0041					
[20] 2.1/re _{2.1}	-4.6%	0.85	0.81	0.0028	0.89	0.78	0.0060	0.88	0.83	0.0068	0.90	-0.0034					

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- All MODIS/eMAS measurements view angle matched (VAM)
- VAMR – view angle match region
- “Full Region” - all VAMR data approx. \pm 5 minutes of overpass
- See imagery for pixel/line data that defines VAMR

- eMAS calibration reference: [pre-deployment lab cal](#)

Terra/eMAS Reflectance Comparisons

[Band] CW (μm) or Cloud Retrieval	Pre/Post- Calibration Change	FL# 3: Aug 02				3: Sept 06				2: Oct 24			
		Full region (VAMR-1)	Land/Bkn Cirrus (VAMR-2)	Land/Ci (VAMR-3)*	Stratus+open Ocean (VAMR-4)	Full region (VAMR-1)	Bkn Cu. (VAMR-2)	Scat. Cu (VAMR-3)	Mostly Clear (VAMR-4)	Full region (VAMR-1)	Stratus+ earlier (VAMR-2)	Clear (VAMR-3)**	Stratus (VAMR-4)
[1] 0.47	-7.1%	1.09	0.99	1.08	1.13	1.07	1.02	1.11	1.10	1.15	1.13	1.20	1.15
[2] 0.55	-6.6%	0.99	0.93	1.01	1.02	0.95	0.91	0.99	0.97	1.01	1.01	1.03	1.01
[3] 0.65	-5.2%	0.98	0.90	0.97	1.02	0.93	0.88	0.95	0.93	0.99	0.97	0.97	0.99
[7] 0.86/tau _{2.1}	-6.5%	0.98	0.93	0.95	1.06	0.97	0.93	0.99	0.98	0.99	0.97	0.99	0.99
[10] 1.6/re _{1.6}	-4.9%	1.04	1.10	1.05	1.06	0.99	0.97	1.00	1.00	1.02	1.02	1.05	1.02
[20] 2.1/re _{2.1}	-4.6%	0.93	0.87	0.92	0.96	0.88	0.83	0.87	0.85	0.90	0.90	0.89	0.90

* Data from 6-9 prior to overpass time

** Data from 10-14 prior to overpass time

Aqua/eMAS Reflectance Comparisons

[Band] CW (μm) or Cloud Retrieval	Pre/Post- Calibration Change	FL# 16: Aug 21				7: Sept 9				11: Sept 11		
		Full region (VAMR-1)	Anvil Cloud (VAMR-2)	Bkn Cu. (VAMR-3)	Mostly Clear (VAMR-4)	Full region (VAMR-1)	Bkn Cu. (VAMR-2)	Scat. Cu (VAMR-3)	Mostly Clear (VAMR-4)	Full region (VAMR-1)	Bkn Cu. (VAMR-2)	Mostly Clear (VAMR-3)
[1] 0.47	-7.1%	1.04	1.02	1.06	1.09	1.10	1.13	1.10	1.10	1.08	1.06	1.08
[2] 0.55	-6.6%	0.94	0.93	0.96	0.98	1.00	1.03	0.99	0.98	0.98	0.96	0.98
[3] 0.65	-5.2%	0.92	0.91	0.92	0.90	0.94	0.99	0.94	0.93	0.94	0.92	0.93
[7] 0.86/tau _{2.1}	-6.5%	Aqua sat.	Aqua sat.	0.95	0.97	0.96	0.97	0.96	0.96	0.96	0.94	0.96
[10] 1.6/re _{1.6}	-4.9%	1.03	0.99	1.00	1.03	1.03	1.06	1.01	1.00	1.04	1.04	1.02
[20] 2.1/re _{2.1}	-4.6%	0.85	0.72	0.85	0.85	0.88	0.91	0.88	0.89	0.90	0.90	0.88